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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,678	07/15/2003	Laurent Francis Alloin	060707-1600	7062
24504	7590	11/24/2006	EXAMINER	
THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP 100 GALLERIA PARKWAY, NW STE 1750 ATLANTA, GA 30339-5948			TRAN, KHANH C	
			ART UNIT	PAPER NUMBER
			2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/618,678

Applicant(s)

ALLOIN, LAURENT FRANCIS

Examiner

Khanh Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-10,13-18,20-24,27 and 28 is/are rejected.
- 7) ☒ Claim(s) 5,11,12,19,25 and 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-4, 6-7, 13-18, 20-21 and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amrany et al. U.S. Patent 6,999,504 B1.

Regarding claim 1, Amrany et al. teachings apply to DSL systems as disclosed in column 5 lines 1-10. Referring to FIG. 4, in column 7 lines 25-67, Amrany et al. teachings is directed to a system and method for canceling crosstalk (or otherwise reducing the effects of crosstalk) on a local loop 130, which carries a first signal $r(t)$. A fundamental feature of the present invention is the utilization of a common mode signal, obtained from the local loop, to generate a second signal $p(t)$. Both of these signals ($r(t)$ and $p(t)$) are utilized to create multiple independent equations that can be solved to either directly approximate the remotely transmitted signal $e(t)$, or to approximate a measure of crosstalk on the local loop, and from the measure of crosstalk approximate the transmitted signal $e(t)$. It is assumed that both modes experience NEXT due to at least one disturbance source. For the moment, we consider only one disturber $u(t)$ (the extension to two or more disturbers is straightforward). In view of that, the received signal includes a desired signal plus an interferer as claimed.

Amrany et al. does not explicitly teach frequency shifting the received signal to provide multiple versions of the received signal as set forth in the application claim.

As recited above, the second signal $p(t)$ is derived from the first signal $r(t)$ to create multiple independent equations that can be solved to either directly approximate the remotely transmitted signal $e(t)$, or to approximate a measure of crosstalk on the local loop, and from the measure of crosstalk approximate the transmitted signal $e(t)$. As shown in equations 2-3 (column 8 lines 1-20), because the frequency of the common mode signal $p(t)$ is different with that of the received signal $r(t)$ and because $p(t)$ is derived from the received $r(t)$, one of ordinary skill in the art would have recognized that the act of deriving $p(t)$ corresponds to the claimed frequency shifting. As further disclosed in column 7 lines 45-55, Amrany et al. considers only one disturbance source, however, the extension of two or more disturbers is straight forward.

Referring to FIG. 5, the received signal ($r(t)$) is sampled and converted by analog to digital (A/D) converter 202 into a sampled signal ($r(n)$). The signal output from the A/D 202 is then passed through a low-pass filter 204, which prevents aliasing. The second signal ($p(t)$) is sampled and converted by A/D converter 206 into a sampled signal ($p(n)$). The signal output from the A/D 206 is then passed through a low-pass filter 208, which prevents aliasing of the second signal. Each data stream is then processed separately by time-domain equalizers 210 and 212. Thereafter, the respective data streams are processed in the time domain processing circuitry 214. This circuitry performs the mathematical processing, including the convolution and de-convolution operations, for solving the equations of Equations 2 and 3, to determine the

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crosstalk components and/or the original transmitted signals. In light of the foregoing disclosure, the circuitry performs equivalent claimed step of summing the outputs.

Amrany et al. invention differs from the pending claim in that Amrany et al. teaches the step of down-sampling before the step of providing a combined crosstalk equalizer and frequency shifted adaptive filters as claimed. Because the down-sampling process is for reducing processing time of the circuitry, therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Amrany et al. invention to perform the step of downsampling after time-domain equalizers 210 and 212, since downsampling is performed before the circuitry.

Regarding claim 2, as recited in claim 1 rejection, the circuitry performs the mathematical processing, including the convolution and de-convolution operations, for solving the equations of Equations 2 and 3, to determine the crosstalk components and/or the original transmitted signals.

Regarding claim 3, referring to FIG. 7, in column 10 lines 10-35, Amrany et al. teaches that during a training or learning phase of a modem, certain variables and/or loop characteristics (e.g., loop impulse response) are computed and/or estimated (step 402). These computed/estimated values are later used during modem operation. During this later modem operation, a first signal $r(t)$ is received on a local loop (step 404). At the same time, a second signal $p(t)$ is obtained from the common mode (step 405). Generating/obtaining the second signal $p(t)$ in this way provides a measure of

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redundancy, which is used to establish multiple, independent equations in the form of Equations 2 and 3 above, which can be solved to compute (or closely estimate) the crosstalk (step 406). After the crosstalk is computed, it may be subtracted from the received signal to obtain the transmitted signal (step 408). Hence, in view of that, the computed/estimated values of time-domain equalizers 210 and 212 match the values of a target filter.

Regarding claim 4, in column 3 line 65 via column 4 line 10, the modem learning phase may be utilized to compute some of these terms, using blind, semi-blind, or supervised techniques.

Regarding claim 6, claim is rejected on the same ground as for claim 4 because of similar scope. In supervised techniques, the training signal is the desired signal.

Regarding claim 7, as recited in claim 3 rejection, the second signal ($p(t)$) is generated at the receiver to provide a measure of redundancy, which is used to establish multiple, independent equations in the form of Equations 2 and 3 above, which can be solved to compute (or closely estimate) the crosstalk (step 406).

Regarding claim 13, in column 9 lines 25-35, the received signal $r(t)$ is over-sampled and converted by analog to digital (A/D) converter. The signal output from A/D 202 is then passed through a low-pass filter 204 to prevent aliasing.

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Regarding claim 14, as recited in claim 13 rejection, low-pass filters 204 and 208 are employed to avoid aliasing and isolate the desired components.

Regarding claim 15, claim is rejected on the same ground as for claim 1 because of similar scope.

Regarding claim 16, claim is rejected on the same ground as for claim 2 because of similar scope.

Regarding claim 17, claim is rejected on the same ground as for claim 3 because of similar scope.

Regarding claim 18, claim is rejected on the same ground as for claim 4 because of similar scope.

Regarding claim 20, claim is rejected on the same ground as for claim 6 because of similar scope.

Regarding claim 21, claim is rejected on the same ground as for claim 7 because of similar scope.

Regarding claim 27, claim is rejected on the same ground as for claim 13 because of similar scope.

Regarding claim 28, claim is rejected on the same ground as for claim 14 because of similar scope.

2. Claims 8-10 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amrany et al. U.S. Patent 6,999,504 B1.as applied to claim 1 above, and further in view of admitted prior art in the original disclosure.

Regarding claim 8, Amrany et al. does not teach the interferer is cyclostationary as claimed in the application claim.

Admitted prior art on page 4 of the original disclosure discusses the properties of the interference is cyclostationary in nature. Since the interference is cyclostationary in nature, one of ordinary skill would have recognized that the disturber in Amrany et al. invention is also cyclostationary because Amrany et al. discusses similar crosstalk situation.

Regarding claim 9, in column 14 lines 5-15, the crosstalks are finite alphabet in the time domain (HDSL, ISDN, T1).

Regarding claim 10, as further explained on page 6 of the original disclosure, admitted prior art teach in a system operating in an Annex C environment, NEXT cross-

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talk from existing TCM-DMT is a major performance-limiting impairment for the ADSL DMT transmission.

Regarding claim 22, claim is rejected on the same ground as for claim 8 because of similar scope.

Regarding claim 23, claim is rejected on the same ground as for claim 9 because of similar scope.

Regarding claim 24, claim is rejected on the same ground as for claim 10 because of similar scope.

Allowable Subject Matter

3. Claims 5, 11-12, 19 and 25-26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ono et al. U.S. Patent 5,859,914 discloses "Acoustic Echo Canceller".

Tahernezhaadi et al. U.S. Patent 6,944,289 B2 discloses "Delay Insertion For Echo Cancellation, With Echo Suppression, In A Communication Network".

Duttweiler U.S. Patent 5,566,167 discloses "Subband Echo Canceller".

Bombay et al. U.S. Patent 6,999,517 B1 discloses "Method And Apparatus For Transmission Of Data On Multiple Propagation Modes With Far-End Cross-Talk Cancellation".

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Tran whose telephone number is 571-272-3007. The examiner can normally be reached on Monday - Friday from 08:00 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KCT

Khanh Cong Tran 11/21/06

Khanh Tran
Primary Examiner